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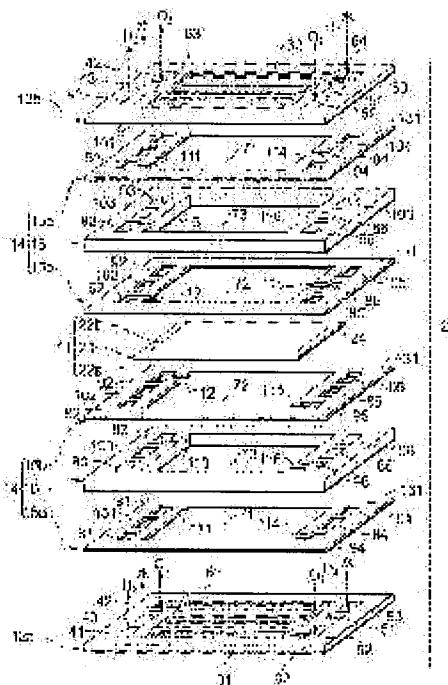
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(54) UNIT CELL, METHOD OF MANUFACTURING UNIT CELL, FUEL CELL, AND METHOD OF MANUFACTURING FUEL CELL



(57)Abstract:

PROBLEM TO BE SOLVED: To provide a unit cell appropriately enhancing productivity and appropriately joining components, to provide a method of manufacturing the unit cell, and to provide a fuel cell and its manufacturing method.

SOLUTION: The unit cell 2 of the fuel cell 1 is constituted by stacking a plurality of components, and at least a part of components out of the plurality of components are joined with a pressure sensitive adhesive double coated tape 15a (15b). The components joined with the pressure sensitive adhesive double coated tape 15a (15b) are an electrolyte membrane 21 of an MEA 11 and a separator 12a (12b). An elastic component 16 is arranged between them, the elastic component 16 and the electrolyte membrane 21 are joined with the pressure sensitive adhesion double coated tape 15b, and the elastic component 16 and the separator 12a

(12b) are joined with the pressure sensitive adhesive double coated tape 15a.

TECHNICAL FIELD

[Field of the Invention]

[0001]

This invention relates to the manufacture approach of the manufacture approach of the cell in which the components which constitute especially a cell come to carry out a laminating, and a cell, a fuel cell, and a fuel cell about the cell (single cel) used as the minimum generation-of-electrical-energy unit in a fuel cell.

PRIOR ART

[Background of the Invention]

[0002]

Generally, the cell of a fixed macromolecule mold consists of separators of the pair which pinches MEA (Membrane Electrode Assembly) and MEA which consist of an electrode of the pair allotted to an electrolyte membrane and its both sides, and has a laminating gestalt as a whole (for example, patent reference 1 reference.). A generation of electrical energy of a cell is performed by oxidation gas or fuel gas being supplied to each electrode through the gas passageway formed in each separator. The fuel cell of stack structure consists of carrying out two or more laminatings of the cell. In case the cell of the patent reference 1 is constituted, adhesives are applied to the predetermined location of the opposed face of both separators, and between separators is fixed with adhesives.

[0003]

Moreover, other different cells from the above-mentioned laminating gestalt are known (for example, patent reference 2 reference.). this cell comes out with the frame of the pair of the shape of a frame which pinches the periphery section of the electrolyte membrane of MEA and MEA, and constitutes an electrolyte membrane member. And the collecting electrode plate in which the gas passageway was formed is arranged on the both sides of an electrolyte membrane member, and a separator is further allotted to the outside of each collecting electrode plate, respectively. Also when such a component part is unified and it constitutes a cell, while using adhesives between a frame and the periphery section of an electrolyte membrane, adhesives are used between the frame and the separator.

[Patent reference 1] JP,2003-86229,A (the 3rd page and Fig. 2)

[Patent reference 2] JP,2004-6419,A (the 6th page and Fig. 1)

EFFECT OF THE INVENTION

[Effect of the Invention]

[0023]

According to the cell and its manufacture approach of this invention, since the component part is quickly [appropriately and] joinable, productivity can be raised appropriately.

[0024]

According to the fuel cell and its manufacture approach of this invention, since two or more cells are quickly [appropriately and] joinable, productivity can be raised appropriately similarly.

CLAIMS

[Claim(s)]

[Claim 1]

It is the cell which comes to carry out the laminating of two or more components which constitute the cell of a fuel cell,

The cell to which between some [at least] components was joined with the double-sided tape among two or more of the components.

[Claim 2]

One of the components joined with said double-sided tape is a cell according to claim 1 which is a separator or an electrolyte membrane.

[Claim 3]

One of the components joined with said double-sided tape is a cell according to claim 1 which are the components which have resiliency.

[Claim 4]

The components which have said resiliency are the cells according to claim 3 which have been arranged between an electrolyte membrane and a separator and were joined to each of this electrolyte membrane and a separator with the double-sided tape.

[Claim 5]

Said double-sided tape is the cell [equipped with the layer which has resiliency] according to claim 1 or 2.

[Claim 6]

Said double-sided tape has an adhesive layer and the stratum disjunctum prepared in each side side of the front flesh side of this adhesive layer,

Said stratum disjunctum is a cell given in claim 1 which has a larger area than said adhesive layer thru/or any 1 term of 4.

[Claim 7]

It is the fuel cell which comes to carry out two or more laminatings of the cell of a publication to claim 1 thru/or any 1 term of 6,

The fuel cell to which between some [at least] cells was joined with the double-sided tape among two or more of the cells.

[Claim 8]

It is the fuel cell which comes to carry out two or more laminatings of the cell,

The fuel cell to which between some [at least] cells was joined with the double-sided tape among two or more of the cells.

[Claim 9]

It is the manufacture approach of the cell which carries out the laminating of two or more components, and constitutes the cell of a fuel cell,

The manufacture approach of a cell including the process which joins between some [at least] components with a double-sided tape among two or more of the components.

[Claim 10]

It is the manufacture approach of the fuel cell which carries out two or more laminatings of the cell, and constitutes a fuel cell,

The manufacture approach of a fuel cell including the process which joins between some [at least] cells with a double-sided tape among two or more of the cells.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[Field of the Invention]

[0001]

This invention relates to the manufacture approach of the manufacture approach of the cell in which the components which constitute especially a cell come to carry out a laminating, and a cell, a fuel cell, and a fuel cell about the cell (single cel) used as the minimum generation-of-electrical-energy unit in a fuel cell.

[Background of the Invention]

[0002]

Generally, the cell of a fixed macromolecule mold consists of separators of the pair which pinches MEA (Membrane Electrode Assembly) and MEA which consist of an electrode of the pair allotted to an electrolyte membrane and its both sides, and has a laminating gestalt as a whole (for example, patent reference 1 reference.). A generation of electrical energy of a cell is performed by oxidation gas or fuel gas being supplied to each electrode through the gas passageway formed in each separator. The fuel cell of stack structure consists of carrying out two or more laminatings of the cell. In case the cell of the patent reference 1 is constituted, adhesives are applied to the predetermined location of the opposed face of both separators, and between separators is fixed with adhesives.

[0003]

Moreover, other different cells from the above-mentioned laminating gestalt are known

(for example, patent reference 2 reference.). this cell comes out with the frame of the pair of the shape of a frame which pinches the periphery section of the electrolyte membrane of MEA and MEA, and constitutes an electrolyte membrane member. And the collecting electrode plate in which the gas passageway was formed is arranged on the both sides of an electrolyte membrane member, and a separator is further allotted to the outside of each collecting electrode plate, respectively. Also when such a component part is unified and it constitutes a cell, while using adhesives between a frame and the periphery section of an electrolyte membrane, adhesives are used between the frame and the separator.

[Patent reference 1] JP,2003-86229,A (the 3rd page and Fig. 2)

[Patent reference 2] JP,2004-6419,A (the 6th page and Fig. 1)

[Description of the Invention]

[Problem(s) to be Solved by the Invention]

[0004]

Like the manufacture approach of such a conventional cell, when using adhesives for junction between component parts, the setting time will be required. For this reason, before a component part is joined certainly, long time amount will be taken, and it becomes difficult to improve the productivity of a cell. Moreover, the same problem has occurred also in lamination of a cell.

[0005]

This invention sets it as the purpose to offer the manufacture approach of the manufacture approach of the cell which can raise productivity appropriately and can join a component part appropriately, and a cell, a fuel cell, and a fuel cell.

[Means for Solving the Problem]

[0006]

The cell of this invention is a cell which comes to carry out the laminating of two or more components which constitute the cell of a fuel cell, and between some [at least] components is joined with a double-sided tape among two or more of the components.

[0007]

The manufacture approach of the cell of this invention is the manufacture approach of the cell which carries out the laminating of two or more components, and constitutes the cell of a fuel cell, and includes the process which joins between some [at least] components with a double-sided tape among two or more of the components.

[0008]

According to these configurations, between components is appropriately [quickly and] joinable using the adhesiveness of a double-sided tape. The time amount which manufacture of a cell takes to this by the setting time compared with the case where adhesives are used can be shortened.

[0009]

Here, a fuel cell may be the thing of other types, such as for example, not only the suitable solid-state macromolecule mold for a fuel cell powered vehicle but a phosphoric-acid mold. Two or more components which constitute a cell correspond to the components with which a frame-like member also constitutes a cell in a configuration like a publication in the above-mentioned patent reference 2, although an electrolyte membrane, an electrode, and a separator are generally mentioned.

[0010]

Here, the double-sided tape is synonymous with that it writes a double faced adhesive

tape and a pressure sensitive adhesive double coated tape [that]. As for a double-sided tape, it is desirable that having the predetermined description required of the specification of a fuel cell has airtightness, waterproofness, predetermined thermal resistance, and predetermined acid resistance preferably. In addition, there may be more than one between the components joined with a double-sided tape, and that from which descriptions, such as size of a double-sided tape, adhesiveness, and ******, differ in that case (not restricted among some components.) may be used.

[0011]

As for one of the components joined with a double-sided tape, in the above-mentioned case, it is desirable that they are a separator or an electrolyte membrane.

[0012]

According to this configuration, an electrolyte membrane and a separator can be joined now appropriately and quickly.

[0013]

Similarly, as for one of the components joined with a double-sided tape, it is desirable that they are the components which have resiliency. As for especially the components that have resiliency, it is desirable for it to have been arranged between an electrolyte membrane and a separator and to have been joined to each of this electrolyte membrane and a separator with the double-sided tape.

[0014]

According to these configurations, the components which have resiliency are inserted with an electrolyte membrane and a separator, and it will be in the condition of having joined each of those ** with the double-sided tape. In this condition, the components which have resiliency may deform into inboard slightly. Since it acts in the direction in which the force which is going to return to the original form of the components which have resiliency by this heightens the junction force by the double-sided tape, the junction force, seal ****, etc. can be raised suitably.

[0015]

Or as for a double-sided tape, it is desirable to have had the layer which has resiliency.

[0016]

Since a double-sided tape may function as the components which have the above-mentioned resiliency similarly according to this configuration, the junction force between the components joined with the double-sided tape etc. can be heightened suitably.

[0017]

It is desirable that a double-sided tape has an adhesive layer and the stratum disjunctum prepared in each side side of the front flesh side of this adhesive layer, and stratum disjunctum has a larger area than an adhesive layer in these cases.

[0018]

According to this configuration, a double-sided tape can join between components through an adhesive layer by separating stratum disjunctum from an adhesive layer. Since stratum disjunctum has a larger area than an adhesive layer especially, in the time of storage of a double-sided tape etc., an adhesive layer can be protected from dust etc., and the handling nature of a double-sided tape can be improved.

[0019]

The fuel cell of this invention is a fuel cell which comes to carry out two or more laminatings of the cell of above-mentioned this invention, and between some [at least]

cells is joined with a double-sided tape among two or more of the cells.

[0020]

Other fuel cells of this invention are fuel cells which come to carry out two or more laminatings of the cell, and between some [at least] cells is joined with a double-sided tape among two or more of the cells.

[0021]

The manufacture approach of the fuel cell of this invention is the manufacture approach of the fuel cell which carries out two or more laminatings of the cell, and constitutes a fuel cell, and includes the process which joins between some [at least] cells with a double-sided tape among two or more of the cells.

[0022]

According to these configurations, with a double-sided tape, between cells can be joined quickly and the production time of a fuel cell can be shortened further.

[Effect of the Invention]

[0023]

According to the cell and its manufacture approach of this invention, since the component part is quickly [appropriately and] joinable, productivity can be raised appropriately.

[0024]

According to the fuel cell and its manufacture approach of this invention, since two or more cells are quickly [appropriately and] joinable, productivity can be raised appropriately similarly.

[Best Mode of Carrying Out the Invention]

[0025]

Hereafter, with reference to an accompanying drawing, the fuel cell concerning the suitable operation gestalt of this invention is explained. This fuel cell is using a double-sided tape on the occasion of junction between the components which come to carry out two or more laminatings of the cell used as the minimum generation-of-electrical-energy unit, and constitute a cell, and raises the productivity of a cell and a fuel cell. Below, the fuel cell of the suitable solid-state polyelectrolyte mold for mount is explained to an example.

[0026]

As shown in drawing 1 , a fuel cell 1 has the stack body 3 which carried out the laminating of two or more cells 2, one by one, arranges respectively a collecting electrode plate 6, an electric insulating plate 7, and an end plate 8 with output terminal 5 on the outside of the cell 2 located in the both ends of the stack body 3, and is constituted. Both the end plates 8 and the tension plate outside drawing prepared as built over between eight are that bolt immobilization is carried out at each end plates 8 and 8, and the fuel cell 1 is in the condition that predetermined compressive force was applied in the direction of a laminating of a cell 2.

[0027]

As shown in drawing 2 and drawing 3 , the principal part of a cell 2 consists of separators 12a and 12b of MEA11 and a pair. Between MEA11 and each separators 12a and 12b is joined by the junction units 14 and 14 which consist of double-sided tapes 15a and 15b of two sheets, and resiliency components 16. Such each part articles have the appearance configuration of a plane view rectangle, and the appearance configuration of Separators 12a and 12b and each junction units 14 and 14 is in agreement. On both sides of MEA11,

as a cell 2 carries out the laminating of double-sided tape 15b, the resiliency components 16, double-sided tape 15a, and the separator 12a (12b) at order, it is constituted by both sides.

[0028]

MEA11 consists of an electrolyte membrane 21 which consists of ion exchange membrane of polymeric materials, and electrodes 22a and 22b (a cathode and anode) of the pair which sandwiched the electrolyte membrane 21 from both sides, and has the laminating gestalt as a whole. The electrolyte membrane 21 is slightly formed greatly in size rather than each electrodes 22a and 22b. An electrolyte membrane 21 is in the condition which left the periphery section 24, and has joined each electrodes 22a and 22b by hot pressing. As for the periphery section 24, it is desirable that surface treatment in consideration of the adhesive property of double-sided tape 15b is performed.

[0029]

Electrodes 22a and 22b consist of carbonaceous materials (diffusion layer) of the porosity which bound the catalyst of platinum etc. Oxidation gas, such as air and an oxidizer, is supplied to one electrode 22a (cathode), and the hydrogen gas as fuel gas is supplied to electrode 22b (anode) of another side. By these two gas, electrochemical reaction arises within MEA11 and a cell 2 acquires electromotive force. Each electrodes 22a and 22b attend widely the Taikai regio oralis 71, 72, and 73 of the center section of each junction units 14 and 14, and it is in contact with the part of each separators 12a and 12b with which the gas passageway 31 of oxidation gas or hydrogen gas was formed.

[0030]

Separators 12a and 12b consist of conductive gas non-penetrated ingredients. As a conductive ingredient, metals (metal), such as aluminum besides the rigid resin which has carbon and conductivity, for example, and stainless steel, are mentioned. The base material of the separators 12a and 12b of this operation gestalt is formed with a tabular metal, and the film excellent in corrosion resistance is covered by the field by the side of the electrode of a base material. In addition, as for the part of Separators 12a and 12b on which double-sided tape 15a is stuck, it is desirable like the periphery section 24 of an electrolyte membrane 21 that surface treatment in consideration of the adhesive property is performed.

[0031]

Irregularity is formed in front ***** by press forming of the separators 12a and 12b being carried out in the part which faces Electrodes 22a and 22b. This heights and crevice have extended in the one direction, respectively, and have demarcated a gas passageway 31 or the cooling water passage 32. That is, two or more formation of the straight gas passageway 31 is carried out in the inside field which becomes the electrode side of Separators 12a and 12b, and two or more formation of the straight cooling water passage 32 is carried out in the field of the outside of the opposite side.

[0032]

In one edge of Separators 12a and 12b, penetration formation of the gas inlet 41 for hydrogen gas, the gas inlet 42 for oxidation gas, and the inflow of cooling water 43 is carried out at the shape of a rectangle. Moreover, in the other-end section of Separators 12a and 12b, penetration formation of the gas outlet 51 for hydrogen gas, the gas outlet 52 for oxidation gas, and the outflow of cooling water 53 is carried out at the shape of a rectangle.

[0033]

The gas inlet 42 and gas outlet 52 for oxidation gas are open for free passage to the gas passageway 31 of oxidation gas through each communication passage 61 and 62 of the entrance side formed in separator 12a at the groove, and an outlet side. The same is said of hydrogen gas and cooling water, for example, the inflow of cooling water 43 and the outflow of cooling water 53 are open for free passage to the cooling water passage 32 through each communication passage 63 and 64 of the entrance side formed in Separators 12a and 12b at the groove, and an outlet side. In addition, although this operation gestalt explained straight passage to the example about the passage 31 and 32 of gas and cooling water, of course, each of such passage 31 and 32 may consist of Serpentine passage.

[0034]

The double-sided tapes 15a and 15b of two sheets and the resiliency components 16 of each junction unit 14 The Taikai regio oralis 71, 72, and 73 by which penetration formation was carried out in the center section, and the inlet-port side stream vent holes 81, 82, and 83 by which penetration formation was carried out corresponding to the gas inlet 41 for the hydrogen gas of Separators 12a and 12b, The outlet side circulation openings 84, 85, and 86 by which penetration formation was carried out corresponding to the gas outlet 51 for hydrogen gas, The inlet-port side stream vent holes 91, 92, and 93 by which penetration formation was carried out corresponding to the gas inlet 42 for oxidation gas, The outlet side circulation openings 94, 95, and 96 by which penetration formation was carried out corresponding to the gas outlet 52 for oxidation gas, It has the inlet-port side stream vent hole 101,102,103 by which penetration formation was carried out corresponding to the inflow of cooling water 43, and the outlet side circulation opening 104,105,106 by which penetration formation was carried out corresponding to the outflow of cooling water 53, respectively.

[0035]

and on the double-sided tapes 15a and 15b of two sheets and the resiliency components 16 in the junction unit 14 shown in the bottom by drawing 2 The communication passage 111,112,113 for oxidation gas which connects the inlet-port side stream vent holes 91, 92, and 93 and the Taikai regio oralis 71, 72, and 73 corresponding to the gas passageway 31 of the oxidation gas of separator 12a, Penetration formation of the communication passage 114,115,116 for oxidation gas and ** which connect the outlet side circulation openings 94, 95, and 96 and the Taikai regio oralis 71, 72, and 73 is carried out.

[0036]

Similarly, corresponding to an entrance side, penetration formation of the communication passage 111,112,113 for hydrogen gas is carried out, respectively, and penetration formation of the communication passage 114,115,116 for hydrogen gas is carried out for the junction unit 14 shown in the bottom by drawing 2 corresponding to the outlet side, respectively. By such passage configuration, even if it forms the junction unit 14 in addition to the principal part (MEA11 and separators 12a and 12b) of a cell 2, gas can be supplied suitable for each electrodes 22a and 22b.

[0037]

The double-sided tapes 15a and 15b of two sheets in the junction unit 14 consist of completely same configurations. One double-sided tape 15a is stuck on the resiliency components 16 and separator 12a (12b), and joins between these. Double-sided tape 15b of another side is stuck on an electrolyte membrane 21 and the resiliency components 16,

and joins between these. Before these junction is presented with each double-sided tapes 15a and 15b, they are prepared in the mode shown in drawing 4 .

[0038]

as shown in drawing 4 , double-sided tape 15a (15b) comes out with an adhesive layer 131 and the stratum disjunctum 132,133 prepared in each side side of the front flesh side of an adhesive layer 131, and is constituted. For example, penetration formation of the Taikai regio oralis 71, the inlet-port side stream vent holes 81 and 91,101, the above-mentioned outlet side circulation openings 84 and 94,104, and the above-mentioned communication passage 111,114 is carried out at the adhesive layer 131 of double-sided tape 15a.

[0039]

The laminating of the stratum disjunctum 132,133 is carried out to the adhesive layer 131 disengageable so that these Taikai regio-oralis 71 grades may be covered. That is, stratum disjunctum 132,133 had a larger area than an adhesive layer 131, and has covered the adhesive layer 131. Thereby, in the time of storage of double-sided tapes 15a and 15b etc., an adhesive layer 131 can be protected from dust etc. Double-sided tapes 15a and 15b are separating stratum disjunctum 132,133 from an adhesive layer 131, and join between the above-mentioned components through an adhesive layer 131.

[0040]

Here, as for an adhesive layer 131, it is desirable to have the adhesion in consideration of the description of the covering side of components for [adhered], such as Separators 12a and 12b and an electrolyte membrane 21. In addition, although mentioned above, as for the covering side of the components for [adhered], it is desirable that surface treatment in consideration of adhesiveness is performed. Moreover, as for an adhesive layer 131, it is desirable to have the predetermined description required of the specification of a fuel cell 1.

[0041]

For example, the adhesive layer 131 has pressure resistance, such as the airtightness of the reinforcement which can bear the hydrogen-gas-pressure force and oxidation gas pressure, and the waterproofness of the reinforcement which can bear a cooling water pressure. Moreover, as for the adhesive layer 131, the operating temperature of the fuel cell 1 of a solid-state polyelectrolyte mold has the thermal resistance which can be borne at the temperature of 80 degrees C - 200 degrees C in view of about 60 degrees C - 80 degrees C. Furthermore, the adhesive layer 131 has the acid resistance which can bear two or less pH in view of pH of the generation water of a fuel cell 1. With this operation gestalt, although the double-sided tapes 15a and 15b of a total of four sheets constituted size, thermal resistance, etc. from same description altogether, they may be made to carry out the design change of the description of double-sided tapes 15a and 15b suitably depending on the components joined by the adhesive layer 131, or a junction part.

[0042]

In addition, as an example of double-sided tapes 15a and 15b, although stratum disjunctum 132,133 was formed in the both sides of an adhesive layer 131, respectively, of course, it does not restrict to this. For example, double-sided tapes 15a and 15b may be formed for an adhesive layer and stratum disjunctum in the both sides focusing on a base layer (base section), respectively. In this case, it is desirable that three layers of the double-sided tape except two stratum disjunctum, i.e., an adhesive layer, a base layer, and

an adhesive layer have predetermined descriptions, such as the above-mentioned airtightness and thermal resistance, as a whole.

[0043]

The resiliency components 16 are formed with silicon resin, and have predetermined resiliency and thickness. The resiliency components 16 have the predetermined description required of the specification of a fuel cell 1 like an adhesive layer 131 while having insulation. Moreover, as for the covering side on which the adhesive layer 131 of the resiliency components 16 is stuck, it is desirable that surface treatment in consideration of adhesiveness is performed. He is trying to heighten the junction force by double-sided tape 15a (15b) compared with the case where the resiliency components 16 are not formed, by forming such resiliency components 16 between an electrolyte membrane 21 and separator 12a (12b).

[0044]

Specifically in the condition of having become a cell 2, an electrolyte membrane 21 and separator 12a (12b) are joined to the both sides through double-sided tapes 15a and 15b on both sides of the resiliency components 16, respectively. This junction is performed by [as carrying out elastic deformation of the resiliency components 16 to inboard slightly]. Moreover, in the condition of having become a fuel cell 1, as mentioned above, since two or more cells 2 by which the laminating was carried out are made to act compressive force from an outside, they can carry out elastic deformation of the resiliency components 16 to inboard slightly also by this. Therefore, it will act in the direction in which the force which is going to return to the original form of the resiliency components 16 heightens the junction force by double-sided tapes 15a and 15b. Thereby, junction force, seal nature, etc. between an electrolyte membrane 21 and Separators 12a and 12b are raised suitably.

[0045]

Here, the manufacture approach about the assembly of each component part of a cell 2 is explained. The Johan section of the cell 2 shown, for example in drawing 2 and the bottom half section are separately constituted from an assembly process of a cell 2, and a cell 2 can consist of piling these up finally. In constituting the bottom half section of a cell 2, the stratum disjunctum 132 by the side of separator 12a of double-sided tape 15a is removed, and it sticks the exposed adhesive layer 131 on the predetermined location of separator 12a. As mentioned above, since the appearance configuration of separator 12a and double-sided tape 15a is in agreement, both can be simply stuck by doubling the appearance of double-sided tape 15a with the appearance of separator 12a.

[0046]

Then, the stratum disjunctum 133 by the side of the resiliency components 16 of double-sided tape 15a is removed, and the resiliency components 16 are stuck on a predetermined location to the exposed adhesive layer 131. Since the appearance configuration of double-sided tape 15a and the resiliency components 16 is in agreement also at this time, both can be stuck simply. Subsequently, the stratum disjunctum 132 by the side of the resiliency components 16 of another double-sided tape 15b is removed, and the exposed adhesive layer 131 is stuck on the predetermined location of the resiliency components 16. And the stratum disjunctum 133 by the side of MEA11 of double-sided tape 15b is removed, and the periphery section 24 of the electrolyte membrane 21 of MEA11 is stuck to the exposed adhesive layer 131. Thereby, the bottom

half section of a cell 2 is constituted.

[0047]

Similarly, the Johan section of the cell 2 which consists of separator 12b, double-sided tape 15a, resiliency components 16, and double-sided tape 15b is constituted. And finally a cell 2 consists of sticking the adhesive layer 131 of double-sided tape 15b of this Johan section on the electrolyte membrane 21 and adhesive layer 131 of the bottom half section. Thus, in case the cell 2 which comes to carry out the laminating of two or more component parts is constituted, double-sided tapes 15a and 15b are used for junction between [, such as between an electrolyte membrane 21 and the resiliency components 16 and between the resiliency components 16 and separator 12a (12b),] components. For this reason, compared with the case where adhesives are used for junction between components, the time amount which junction takes only that setting-time **** can be shortened. Thereby, the productivity (throughput) of a cell 2 can be raised appropriately.

[0048]

Moreover, as compared with the case where adhesives are used for junction between components, temperature management is severe with adhesives at the time of junction. On the other hand, in double-sided tapes 15a and 15b, temperature management becomes simple at the time of junction. Moreover, with adhesives, it becomes it is severe and complicated working spreading management. namely, adhesives -- usually -- liquefaction -- or since it has half-liquefied, it is necessary to apply so that it may not see and (32, 42, 43, 51, 52, 53) come out to the gas passageway 31 or gas inlet 41 of Separators 12a and 12b, and the workability is not good. On the other hand, in double-sided tapes 15a and 15b, it can stick on the front face of Separators 12a and 12b with easily and sufficient workability at the time of junction.

[0049]

Next, the manufacture approach of a fuel cell 1 is explained. First, the laminating of the plurality (for example, 300 sheets) of the cell 2 constituted as mentioned above is carried out, and the stack body 3 is constituted. Under the present circumstances, although the laminating of the adjoining cell 2 is carried out so that each separator 12a and 12b may serve as back doubling, it joins between this separator 12a and 12b with a double-sided tape. That is, between a cell 2 and 2 is joined with a double-sided tape. This double-sided tape can be constituted like the double-sided tapes 15a and 15b applied to the above-mentioned cell 2. In addition, as for the part on which the double-sided tape of Separators 12a and 12b is stuck, it is desirable that surface treatment in consideration of adhesiveness is performed.

[0050]

You may make it join between all the cells 2 and 2 with a double-sided tape, and may make it join between some cells 2 and 2 with a double-sided tape here. As mentioned above, in order that compressive force may act on the stack body 3 in the state of completion, the junction by the cell 2 and the double-sided tape between two is not necessarily indispensable. However, by using a double-sided tape, between a cell 2 and 2 can be made into the condition of temporary junction on the occasion of the laminating of the cell 2 which constitutes the stack body 3, and the assembly of the stack body 3 can be performed simply. Moreover, with a double-sided tape, between a cell 2 and 2 can be joined in reinforcement, and a cell 2 and the seal nature between two can be raised further.

[0051]

After the assembly of the stack body 3, the laminating of an electric insulating plate 7 and the collecting electrode plate 6 is carried out to order to the installed end plate 8, and, subsequently the laminating of the stack body 3 is carried out. And finally a fuel cell 1 will be in the condition that predetermined compressive force was applied in the direction of a laminating of a cell 2. Thus, since a fuel cell 1 is manufactured using a double-sided tape, the time amount which manufacture takes can be shortened compared with the case where adhesives are used, and the throughput of a fuel cell 1 can be raised. Moreover, temperature management and spreading management can be simplified.

[0052]

In addition, this operation gestalt can apply various modifications. For example, the resiliency components 16 can be considered as the configuration contacted not only to the electrolyte membrane 21 but to electrode 22a (22b). In this case, it is good also as a configuration which prepares the above-mentioned double-sided tape 15b between the resiliency components 16 and an electrolyte membrane 21, and does not prepare double-sided tape 15b between the resiliency components 16 and electrode 22a (22b). But in order to consider the resiliency components 16 as the configuration contacted also to electrode 22a (22b), on the resiliency components 16, it is desirable to form the annular vadum corresponding to the thickness of electrode 22a (22b).

[0053]

Moreover, for example, the resiliency components 16 are also ommissible. In this case, a junction unit consists of a double-sided tape of one sheet, and this double-sided tape will join directly an electrolyte membrane 21 and separator 12a (12b). In this case, it is desirable to have the layer which has resiliency so that a double-sided tape may do so the same function as the resiliency components 16. that is, as for a double-sided tape, it is desirable to come out with the resiliency layer which consists of silicon resin, the above-mentioned adhesive layer 131 prepared in the front ***** side of a resiliency layer, and the above-mentioned stratum disjunctum 132,133 by which the laminating was carried out to each adhesive layer 131, and to be constituted.

[0054]

Next, the modification of a double-sided tape 1 is explained with reference to drawing 5 . Here, double-sided tape 15a stuck on separator 12a which was represented and was shown by drawing 2 and drawing 3 is explained.

[0055]

The Maine tape section 150 of the 1 continuation in which double-sided tape 15a concerning a modification surrounds all the paths (a gas passageway 31, a gas inlet 42, a gas outlet 52, communication passage 61 and 62) relevant to the oxidation gas of separator 12a in the MEA11 side, The subtape section 151,161 of the shape of a frame which surrounds the gas inlet 41 and gas outlet 51 of hydrogen gas of separator 12a in the MEA11 side, it comes out of the inflow of cooling water 43 and the outflow of cooling water 53 of separator 12a with the subtape section 153,163 of the shape of a frame surrounded in the MEA11 side, and is constituted. The subtape section (151,153,161,163) has dissociated with the Maine tape section 150, respectively.

[0056]

Thus, like the above, even if it constitutes double-sided tape 15a from two or more linear tape sections (150 151,153,161,163), while being able to shorten junction between

components, handling nature, such as temperature management, can also be raised. Moreover, compared with the above-mentioned double-sided tape, it is easy to manufacture double-sided tape 15a concerning this modification. Furthermore, according to this double-sided tape 15a, the function which carries out the seal of between components (between separator 12a and the resiliency components 16) can be suitably done so.

[Brief Description of the Drawings]

[0057]

[Drawing 1] It is the perspective view showing the fuel cell concerning an operation gestalt.

[Drawing 2] It is the decomposition perspective view disassembling and showing the cell of the fuel cell concerning an operation gestalt.

[Drawing 3] It is the sectional view showing the configuration of the cell of the fuel cell concerning an operation gestalt.

[Drawing 4] It is the perspective view showing the configuration of the double-sided tape concerning an operation gestalt.

[Drawing 5] It is the perspective view showing the condition of having stuck the double-sided tape concerning a modification on the separator.

[Description of Notations]

[0058]

1 Fuel Cell, 2 Cell, 3 Stack Body, 11 12 MEA, 12B Separator, 14 Junction Unit, 15a, 15B Double-sided Tape, 16 Resiliency Components, 21 Electrolyte Membrane, 22a, 22B Electrode, 131 Adhesive Layer, 132,133 Stratum Disjunctum

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]

[0004]

Like the manufacture approach of such a conventional cell, when using adhesives for junction between component parts, the setting time will be required. For this reason, before a component part is joined certainly, long time amount will be taken, and it becomes difficult to improve the productivity of a cell. Moreover, the same problem has occurred also in lamination of a cell.

[0005]

This invention sets it as the purpose to offer the manufacture approach of the manufacture approach of the cell which can raise productivity appropriately and can join a component part appropriately, and a cell, a fuel cell, and a fuel cell.

MEANS

[Means for Solving the Problem]

[0006]

The cell of this invention is a cell which comes to carry out the laminating of two or more components which constitute the cell of a fuel cell, and between some [at least] components is joined with a double-sided tape among two or more of the components.

[0007]

The manufacture approach of the cell of this invention is the manufacture approach of the cell which carries out the laminating of two or more components, and constitutes the cell of a fuel cell, and includes the process which joins between some [at least] components with a double-sided tape among two or more of the components.

[0008]

According to these configurations, between components is appropriately [quickly and] joinable using the adhesiveness of a double-sided tape. The time amount which manufacture of a cell takes to this by the setting time compared with the case where adhesives are used can be shortened.

[0009]

Here, a fuel cell may be the thing of other types, such as for example, not only the suitable solid-state macromolecule mold for a fuel cell powered vehicle but a phosphoric-acid mold. Two or more components which constitute a cell correspond to the components with which a frame-like member also constitutes a cell in a configuration like a publication in the above-mentioned patent reference 2, although an electrolyte membrane, an electrode, and a separator are generally mentioned.

[0010]

Here, the double-sided tape is synonymous with that it writes a double faced adhesive tape and a pressure sensitive adhesive double coated tape [that]. As for a double-sided tape, it is desirable that having the predetermined description required of the specification of a fuel cell has airtightness, waterproofness, predetermined thermal resistance, and predetermined acid resistance preferably. In addition, there may be more than one between the components joined with a double-sided tape, and that from which descriptions, such as size of a double-sided tape, adhesiveness, and ******, differ in that case (not restricted among some components.) may be used.

[0011]

As for one of the components joined with a double-sided tape, in the above-mentioned case, it is desirable that they are a separator or an electrolyte membrane.

[0012]

According to this configuration, an electrolyte membrane and a separator can be joined now appropriately and quickly.

[0013]

Similarly, as for one of the components joined with a double-sided tape, it is desirable that they are the components which have resiliency. As for especially the components that have resiliency, it is desirable for it to have been arranged between an electrolyte membrane and a separator and to have been joined to each of this electrolyte membrane and a separator with the double-sided tape.

[0014]

According to these configurations, the components which have resiliency are inserted with an electrolyte membrane and a separator, and it will be in the condition of having joined each of those ** with the double-sided tape. In this condition, the components which have resiliency may deform into inboard slightly. Since it acts in the direction in which the force which is going to return to the original form of the components which have resiliency by this heightens the junction force by the double-sided tape, the junction force, seal ****, etc. can be raised suitably.

[0015]

Or as for a double-sided tape, it is desirable to have had the layer which has resiliency.
[0016]

Since a double-sided tape may function as the components which have the above-mentioned resiliency similarly according to this configuration, the junction force between the components joined with the double-sided tape etc. can be heightened suitably.

[0017]

It is desirable that a double-sided tape has an adhesive layer and the stratum disjunctum prepared in each side side of the front flesh side of this adhesive layer, and stratum disjunctum has a larger area than an adhesive layer in these cases.

[0018]

According to this configuration, a double-sided tape can join between components through an adhesive layer by separating stratum disjunctum from an adhesive layer. Since stratum disjunctum has a larger area than an adhesive layer especially, in the time of storage of a double-sided tape etc., an adhesive layer can be protected from dust etc., and the handling nature of a double-sided tape can be improved.

[0019]

The fuel cell of this invention is a fuel cell which comes to carry out two or more laminatings of the cell of above-mentioned this invention, and between some [at least] cells is joined with a double-sided tape among two or more of the cells.

[0020]

Other fuel cells of this invention are fuel cells which come to carry out two or more laminatings of the cell, and between some [at least] cells is joined with a double-sided tape among two or more of the cells.

[0021]

The manufacture approach of the fuel cell of this invention is the manufacture approach of the fuel cell which carries out two or more laminatings of the cell, and constitutes a fuel cell, and includes the process which joins between some [at least] cells with a double-sided tape among two or more of the cells.

[0022]

According to these configurations, with a double-sided tape, between cells can be joined quickly and the production time of a fuel cell can be shortened further.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[0057]

[Drawing 1] It is the perspective view showing the fuel cell concerning an operation gestalt.

[Drawing 2] It is the decomposition perspective view disassembling and showing the cell of the fuel cell concerning an operation gestalt.

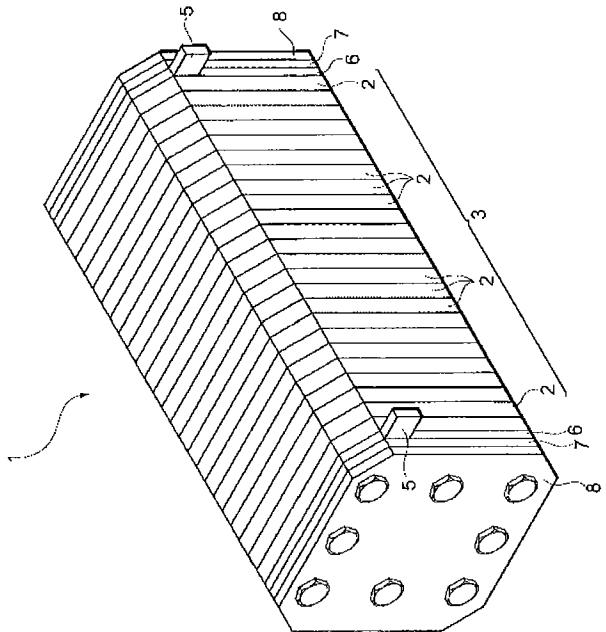
[Drawing 3] It is the sectional view showing the configuration of the cell of the fuel cell concerning an operation gestalt.

[Drawing 4] It is the perspective view showing the configuration of the double-sided tape concerning an operation gestalt.

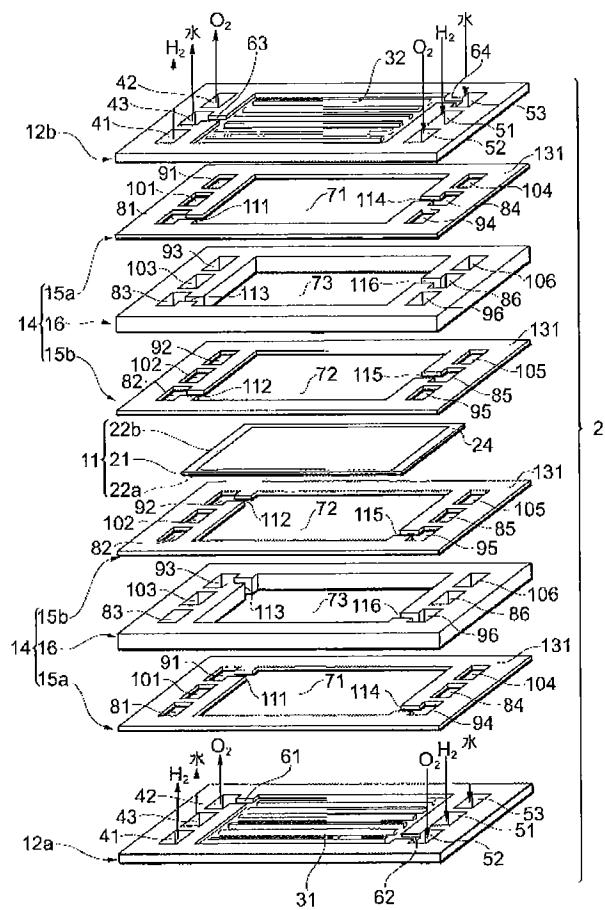
[Drawing 5] It is the perspective view showing the condition of having stuck the double-sided tape concerning a modification on the separator.

DRAWINGS

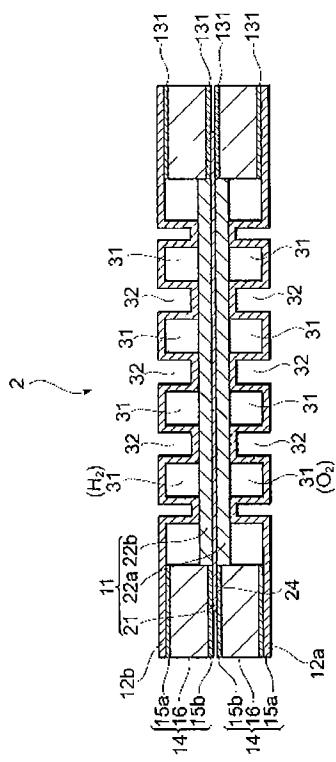
[Drawing 1]



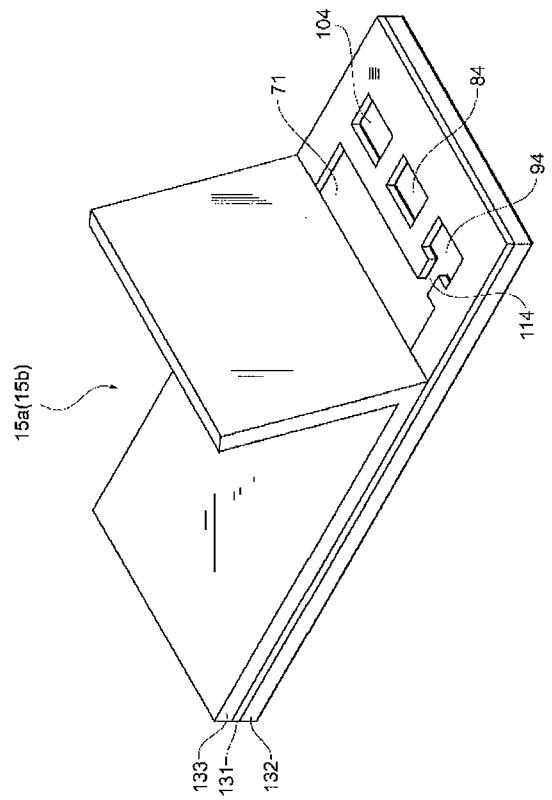
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Drawing 5]

